PERSPECTIVES ON SUSTAINABLE TRANSPORT

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Summary

This chapter offers a social science based introduction to sustainable transport issues. It identifies behavioral motives and policy impediments, while it aims to explore pathways to the future.

1. Praise for Mobility

The author of a classical opus on the development of knowledge, Charles van Doren (1991), offers a fascinating future perspective for the next hundred years. One of the topics discussed by him is *speed*. In his view speed will be one of the most important features of the future. Clearly, electronic information exchange is at present already synchronously possible over the entire globe, so that modern virtual telecommunication has seemingly prompted the age of the *"death of distance"*. But Charles van Doren addresses, in particular, physical distance of people and commodities. He provides a simple calculation to illustrate his point. In the year 1800 the average distance over which one could comfortably travel on a daily basis was 24 miles; in the year 1900 this comfortable travel distance had increased to 120 miles a day, and in the year 2000 even to 600 miles. Assuming a constant efficiency factor 5 over a period of a hundred years, he arrives at the conclusion that the comfortable daily travel distance in the year 2100 will be 3000 miles, and in the year 2200 even 15000 miles. Then one can, in principle, comfortably reach almost each destination on earth in one day.

This image of the flying carpet fulfils all historical dreams on human mobility. It is noteworthy however, that speed as a societal phenomenon has mainly emerged after the Industrial Revolution, where the invention of the steam engine has meant an unprecedented logistic breakthrough. Ever since, speed has become more and more important. Time has become an economic good and evaluation of time has become one of the central elements in transportation economics. Mobility statistics demonstrate clearly that there is one dominant logistic trend: more people become more mobile. (Fink 1993; Salomon et al. 1993).

It is also noteworthy that a supply of more rapid modes of transport (e.g., high speed trains, airplanes) will always be followed by a new demand for these modes. This "law of Say" does not imply, however, that time saving in transport will be used to travel less time. In particular at metropolitan levels, we observe that time saving will immediately be used to make extra trips or to travel over longer distances. We may thus conclude that faster modes of transport imply essentially more miles traveled. (See Zahavi, 1977). Modern man has essentially become a nomadic person. The development of the ICT sector has also led to a virtual global nomadism, which reinforces physical mobility. Internet, multi-media and e-society stimulate a *sense of globality* in contrast to a sense of locality, which has characterized the world until the late twentieth century. (Nijkamp et al, 2000). Admittedly, despite the e-hype it ought to be recognized that by the beginning of the new millennium more than one half of the world population has as yet never made a telephone call.

The emergence of the ICT sector has prompted an intensive debate on the possibilities between physical mobility and virtual communication. Several authors have introduced new concepts such as "electronic cottages" or "global villages", but the statistics speak a different language. Both phenomena are on a rising edge and tend to reinforce each other. The modern telecommunications sector appears to act in the medium term as an additional drive for more mobility.

Mobility has apparently become a normal phenomenon in a modern society and is highly enjoyed by adult individuals. Policy efforts to reduce mobility have largely failed. Therefore, the question arises whether there is much scope for sustainable mobility.

2. Shadowsides of Mobility

A transport-intensive economy has of course many shadowsides: congestion, environmental degradation, traffic unsafety, landscape segmentation, resource depletion etc. (Verhoef 1996). The social costs of the externalities involved are formidable. And there is certainly sufficient reason to support sustainable transport initiatives and behavior. Relevant arguments can be found in environmental goals (e.g., air quality and noise), social goals (e.g., social cohesion, accessibility), economic goals (e.g., efficient operation of labor markets or efficient handling of trade) or technological goals (e.g., development of just-in-time systems). The concerns about the negative externalities of the transport sector have induced a critical reflection on our modern mobile society. An overview of the various externalities involved and of scientific research in this area is contained in the article by Nijkamp and co-authors in the present volume (see: Sustainable Mobility).

From a technological side much attention is given to the development of new transport technologies, which would increase fuel efficiency, as witnessed, for instance, in the "smart car".

From the perspective of social scientists a plea is often made for a change in behavioral patterns, which would imply less time stress. (Schorr 1992). Against this background the notion of a "*time pioneer*" has been introduced, which refers to a drastic "de-

stressing" behavior leading to "slow motion". In the literature a reference is often made to "downshifters". Empirical research however, has demonstrated that the willingness to downshift is rather low, in particular as "slow motion" behavior will normally also imply an income sacrifice (see Höming et al 1995, Nijkamp and Baaijens 1999).

Economists have argued that a proper adherence to market principles might create an efficient solution for the overheated mobility market. Sustainable transport can be achieved by obeying the basic lesson from economics: "*Make Them Pay*". This would imply that all (marginal) social costs would have to be charged to the traveller, an idea already advocated more than 80 years ago by Pigou (1920). Despite the current popularity of this idea, it also suffers from various flaws, which explains why the large-scale introduction and acceptance of this lesson is so slow.

In the first place, the question has to be raised: what has to be paid for? If a simple road charge would have to include all (marginal) social costs related to environmental decay, fatalities, congestion and the like, than we have a case of overshooting, so eloquently described by Herman Daly (1992) as "killing two birds with one stone". Consequently, a balance has to be found between different charging systems or policy instruments, if multiple goals are to be achieved.

A next question is who has to pay to whom? In the case of a large number of "victims", the transaction costs of a financial transfer from "cause to effect" will be prohibitive. Clearly, a government (or any other agency) might then act as a trustee of all "victims", but then the effectiveness of a policy is a source of concern, as there is no direct link any more between payers and receivers of the financial transactions.

And finally, the question is how to create acceptability of a charging system. This is in particular a problem if the revenues of the charging system are used for other purposes than a pure financial compensation (e.g., for welfare benefits). Thus, if road charges are used to improve infrastructure, there may be a public and policy support, but if they are used for public facilities elsewhere, the degree of acceptance will be very low. Thus, a fair revenue and expenditure system are critical success factors (see Verhoef 1996).

To cope with the negative externalities of the transport sector is extremely difficult, as this sector is influenced by a complex force field with many intervening determinants (see Figure 1).

A main problem is that transport is largely a derived demand. It results from industrial, logistic, residential and consumptive decisions all over society. Transport is usually not a goal in itself, but is decisively influenced by forces from other actors in a modern economy. Further details on the structure and facts of the complex force field of transport in the context of environmental objectives can be found in the contributions by Banister in the present volume (see: Sustainable Mobility).

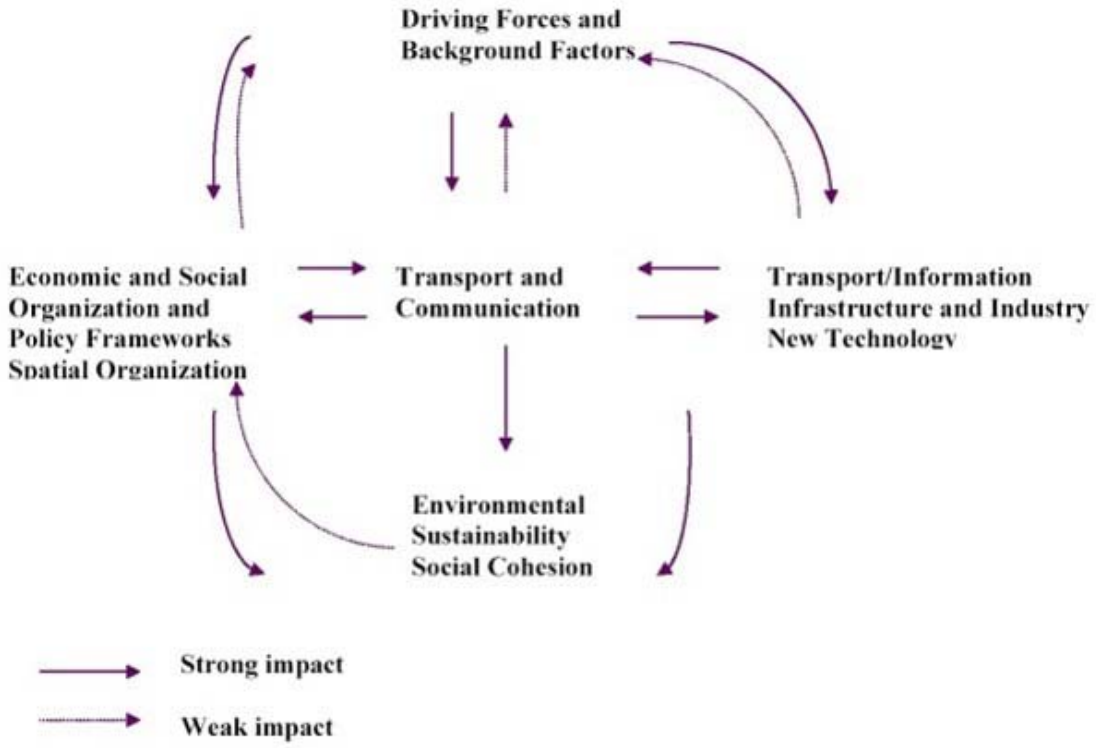

Figure 1: An integrative view on transport

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Biographical Sketch

Peter Nijkamp (1946) graduated from the Erasmus University in Rotterdam, in the area of econometrics. He holds a Ph.D. (cum laude) in non-linear mathematical programming for industrial planning from the same University. Since 1975 Peter Nijkamp has been professor in regional and urban economics and in economic geography at the Free University, Amsterdam. He has a broad expertise in the area of public policy, services planning, infrastructure management and environmental protection. In all these fields he has published various books and numerous articles. He has been an advisor to several Dutch Ministries, regional and local policy councils, employers" organizations, private institutions, the Commission of the European Union (EU), the Organisation for Economic Cooperation and Development (OECD), the European Conference of Ministers in Transport (ECMT), the Asian Development Bank (ADB), the European Roundtable of Industrialists, ICOMOS, the World Bank, and many other institutions.
He has been a guest professor at several universities in Europe, Asia and America. He is doctor honoris causa at the Vrije Universiteit in Brussels and fellow of the Royal Dutch Academy of Science and the World Academy of Arts and Sciences. He is past-president of the Regional Science Association International and chairman of the Network on European Communications and Transport Activity Research (NECTAR). Peter Nijkamp is the 1996 recipient of the most prestigious Spinoza Award in the Netherlands.